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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2000-NM-369-AD; Amendment 39-13240; AD 2003-14-21]

RIN 2120-AA64

Airworthiness Directives; Lockheed Martin Models L-1011 Airplanes and Rolls-Royce plc RB211 Series Turbofan Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD) that is applicable to Lockheed Martin L-1011-385 series airplanes. That AD currently requires modifications of the engine turbine cooling air overheat monitoring panel at the flight engineer/second officer's console, pilot's caution and warning light panel on the main instrument panel, and the installation of a high speed gearbox (HSGB) overheat detector system into the monitoring system for the engine turbine air temperature. This amendment requires the same modifications. In addition, this amendment adds Lockheed Martin L-1011-385 series airplanes with RB211-22B-02 series engines to the applicability, requires installation of a revised engine front bearing housing assembly, installation of a revised speed probe loom electrical support assembly, and installation of a low pressure (LP) compressor shaft extreme axial movement detector system. Also, this amendment requires additional modifications to the engine turbine cooling air overheat monitoring panel at the flight engineer/second officer's console, pilot's caution and warning light panel on the main instrument panel. The actions specified by this AD are intended to prevent undetected fires originating within the HSGB from breaching the HSGB case, which could result in engine damage and increased difficulty in extinguishing a fire, and to prevent undetected LP compressor shaft location bearing failure, which could result in LP compressor and turbine shaft assembly failure, turbine overspeed, and possible uncontained engine failure.

DATES: Effective August August 25, 2003. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of August 25, 2003.

ADDRESSES: The service information referenced in this AD may be obtained from Rolls-Royce plc, PO Box 31, Derby, England, DE248BJ; telephone: 011-44-1332-242-424; fax: 011-44-1332-245-418 and Lockheed Martin & Logistics Center, 120 Orion Street, Greenville, South Carolina 29605. This information may be examined, by appointment, at the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, 12 New England Executive Park,

Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: James Lawrence, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone: (781) 238-7176; fax: (781) 238-7199, and Robert A. Bosak, Aerospace Engineer, Atlanta Aircraft Certification Office, One Crown Center, Suite 475, 1895 Phoenix Blvd., Atlanta, GA 39348, telephone: (770) 703-6094; fax: (770) 703-6097.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 2000-17-10 R1, Amendment 39-12378 (66 FR 44030 August 22, 2001), which is applicable to Lockheed Martin Models L-1011 airplanes and Rolls-Royce plc RB211 series turbofan engines was published in the Federal Register on March 11, 2003 (68 FR 11476). That action proposed to require:

- Modifications of the engine turbine cooling air panel at the flight engineer/second officer's console, pilot's caution and warning light panel on the main instrument panel.
- Installation of an engine turbine air temperature monitoring system.
- Installation of a revised engine front bearing housing assembly.
- Installation of speed probe loom electrical support assembly part number (P/N) FW15212, if applicable.
- Installation of an LP compressor shaft extreme axial movement detector system. The actions would be required to be done in accordance with RR service bulletin (SB) RB.211-72-6149, Revision 9, dated November 24, 1999, RR SB RB.211-72-C178, Revision 1, dated March 9, 2001, RR SB RB.211-77-C144, Revision 1, dated February 13, 2002, RR mandatory service bulletin RB.211-71-E047, dated August 2, 2002, Lockheed Martin SB 093-77-059, Revision 2, dated April 11, 2002, and Lockheed Martin SB 093-77-060, dated April 11, 2002.

These actions must be done so that the installation of the HSGB overheat detector system and installation of the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system are complete.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. The comments received are all from Lockheed Martin. Due consideration has been given to the comments received.

Clarifications of Modification Description in the Summary

Lockheed Martin requests that the second sentence of the proposal summary be changed to read "That AD currently requires modifications of the engine turbine cooling air overheat monitoring panel at the flight engineer/second officer's console, pilot's caution and warning light panel on the main instrument panel, and the installation of a high speed gearbox (HSGB) overheat detector system into the monitoring system for the engine turbine air temperature." The commenter states that this change clarifies that the modification adds the HSGB overheat detection system in series with the engine turbine cooling air overheat monitoring system. The sentence as-written in the proposal incorrectly states to require installation of an engine turbine air temperature monitoring system.

The FAA agrees and has changed the summary in the final rule accordingly.

Lockheed Martin also requests that the fourth sentence of the proposal summary be changed to read "Also, this proposal would require additional modifications to the engine turbine cooling air overheat monitoring panel at the flight engineer/second officer's console and the pilot's caution and warning light panel on the main instrument panel." The commenter states that this change clarifies which two panels are to be modified.

The FAA agrees and has changed the summary in the final rule accordingly.

Clarification of Modification Description in the Discussion

Lockheed Martin requests that the first sentence of the proposal discussion be changed to read "On August 15, 2001, the FAA issued airworthiness directive (AD) 2000-17-10 R1, Amendment 39-12378 (66 FR 44030 August 22, 2001), to require modifications of the engine turbine cooling air panel at the flight engineer/second officer's console, pilot's caution and warning light panel on the main instrument panel, and the installation of an HSGB overheat detector system into the engine turbine cooling air overheat monitoring system." The commenter states that this change clarifies that the modification adds the HSGB overheat detection system in series with the engine turbine cooling air overheat monitoring system. The sentence as-written in the proposal incorrectly states to require installation of an engine turbine air temperature monitoring system.

The FAA agrees and has changed the summary, which is where this information appears in the final rule, accordingly.

Request To Delete Model RB211-524B-B-02 From Discussion and Applicability

Lockheed Martin requests that model RB211-524B-B-02 engines be deleted from the proposal discussion and from the proposal applicability. The commenter states that model RB211-524B-B-02 engines are not FAA-approved for installation on Lockheed L-1011 model airplanes.

The FAA does not agree. The model RB211-524B-B-02 engine is not currently approved for installation in the Lockheed L-1011 model airplane. However, this model may be in service on other airplanes and therefore the requirements of paragraph (b) of this AD would also be applicable for those installations. Please note that the CAA ADs and the Rolls-Royce service bulletins referenced in this AD apply to the model RB211-524B-B-02 engine as well as those engine models installed on the Lockheed L-1011 model airplane. Based on this, no change is made to the final rule.

Change Description of Method Used To Detect Pending Failure

Lockheed Martin requests that the last sentence in the second paragraph of the proposal discussion be changed to read "The manufacturer states that the method used to detect pending failure of the LP compressor shaft location bearing is to monitor the airborne vibration monitoring system on the flight engineer/second officer's console." The commenter states that the engine vibration monitoring system successfully detected LP location bearing failures.

The FAA does not agree. The vibration monitoring system has detected imminent failures of LP compressor shaft location bearing failures in the past. However, bearing and shaft failures have occurred, suggesting that flight crew reaction time due to workload or other circumstances have rendered vibration monitoring only partially effective. Therefore, no change is made to the final rule.

Clarification of Actions in Discussion

Lockheed Martin requests that the second sentence in the third paragraph of the proposal discussion be changed to read "Those actions must be done so that the installation of the HSGB overheat detector system and installation of the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system are complete."

Lockheed Martin states that this change clarifies that the modification adds the HSGB overheat detection system in series with the engine turbine cooling air overheat monitoring system. The sentence as-written in the proposal incorrectly states to require installation of an engine turbine air temperature monitoring system.

The FAA agrees and has changed the supplementary information paragraph, which is where this information appears in the final rule, accordingly.

Clarification of Service Bulletin (SB) Lockheed Martin SB 093-77-059 Description

Lockheed Martin requests that the fifth service bulletin listed under Manufacturer's Service Information in the proposal be changed to read "Lockheed Martin SB 093-77-059, Revision 2, dated April 11, 2002, which introduces modifications to the airplane instrument panels and consoles, necessary for compatibility with the installation of the HSGB overheat detector system and installation of the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system." The commenter states that this change clarifies that the modification adds the HSGB overheat detection system in series with the engine turbine cooling air overheat monitoring system. The sentence as-written in the proposal incorrectly states to require installation of an engine turbine air temperature monitoring system.

The FAA agrees. However, because SB 093-77-060, Revision 1, dated June 30, 2003, replaces SB 093-77-059 in its entirety, all references to SB 093-77-059 are deleted from the final rule.

Clarification of Lockheed Martin SB 093-77-060 Description

Lockheed Martin requests that the sixth service bulletin listed under Manufacturer's Service Information in the proposal be changed to read "Lockheed Martin SB 093-77-060, dated April 11, 2002, which introduces modifications to the airplane instrument panels and consoles, necessary for compatibility with the installation of Lockheed Martin SB 093-77-059 and the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system." The commenter states that this change is needed to clarify that the modification is necessary for compatibility with SB 093-77-059 and the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system.

The FAA agrees. However, because SB 093-77-060, Revision 1, dated June 30, 2003, replaces SB 093-77-059 in its entirety, all references to SB 093-77-059 are deleted from the final rule.

Clarification of First Requirement Listed in the Proposal

Lockheed Martin requests that the first requirement listed in the proposal under proposed requirements of this AD, be changed to read: "Modifications of the engine turbine cooling air overheat monitoring panel at the flight engineer/second officer's console, pilot's caution and warning light panel on the main instrument panel." The commenter states that this change is needed to clarify that the panel is the engine turbine cooling air overheat monitoring panel.

The FAA agrees and has changed the summary, which is where this information appears in the final rule, accordingly.

Clarification of Second Requirement Listed in the Proposal

Lockheed Martin requests that the second requirement listed in the proposal under proposed requirements of this AD, be changed to read "Installation of an HSGB overheat detector system." The commenter states that the existing second proposed requirement is referencing a system that already exists on the airplane.

The FAA agrees and has changed the summary, which is where this information appears in the final rule, accordingly.

Changes to Economic Analysis

Lockheed Martin requests that the economic analysis be changed to reflect that instead of one engine requiring a speed probe loom electrical support assembly part number FW15212, ten engines require this part, and to reflect that the total cost of the AD to U.S. operators is estimated to be $19,996,560.

The FAA agrees and has made these changes in the economic analysis in the AD.

Delete Compliance Paragraph (a)(2)

Lockheed Martin requests that paragraph (a)(2) be deleted from the AD. The commenter states that Lockheed Martin SB 093-77-059 will be reconfigured when complying with Lockheed Martin SB 093-77-060.

The FAA agrees. SB 093-77-060, Revision 1, dated June 30, 2003, replaces SB 093-77-059 in its entirety, and therefore, paragraph (a)(2) is not required. Paragraph (a)(2) has been deleted and the following substeps have been relettered in the final rule.

Change Wording in Compliance Paragraph (a)(5)

Lockheed Martin requests that proposal paragraph (a)(5) be changed to read: "Modify airplane instrument panels and consoles with the installation of the engine failure indicators, failure lenses, and marker, in accordance with Lockheed Martin SB 093-77-060, dated April 11, 2002. The commenter states that this change provides clarity on how the panels and consoles are modified.

The FAA agrees and has changed the affected paragraph by referencing SB 093-77-060, Revision 1, dated June 30, 2003.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously.

Economic Analysis

There are approximately 492 engines and 164 airplanes of the affected design in the worldwide fleet. The FAA estimates that 270 engines installed on 90 airplanes of U.S. registry would be affected by this AD. The FAA estimates that it would take approximately 40 work hours per engine to accomplish the actions, and that the average labor rate is $60 per work hour. Required parts would cost approximately $58,956 per engine. The FAA estimates that it would cost approximately $37,920 per airplane to do the airframe panel modifications. In addition, ten airplanes of U.S. registry would require speed probe loom electrical support assemblies P/N FW15212 installed on all three engines, at an estimated cost of $588 per engine. Based on these figures, the total cost of the AD to U.S. operators is estimated to be $19,996,560.

Regulatory Analysis

This final rule does not have federalism implications, as defined in Executive Order 13132, because it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Accordingly, the FAA has not consulted with state authorities prior to publication of this final rule.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39–AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. Section 39.13 is amended by removing Amendment 39-12378, 66 FR 44030 August 22, 2001), and by adding a new airworthiness directive:

AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
Federal Aviation Administration

We post ADs on the internet at "www.faa.gov"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2003-14-21 Lockheed Martin and Rolls-Royce plc: Amendment 39-13240. Docket No. 2000-NM-369-AD. Supersedes AD 2000-17-10 R1, Amendment 39-12378.

Applicability: This airworthiness directive (AD) is applicable to Lockheed Martin models L-1011-385-1, L-1011-385-1-14, L-1011-385-1-15, and L-1011-385-3 airplanes and Rolls-Royce plc (RR) RB211-22B-02, RB211-524B-02, RB211-524B-B-02, RB211-524B3-02, RB211-524B4-02, and RB211-524B4-D-02 series turbofan engines.

Compliance: Compliance with this AD is required as indicated, unless already done.

To prevent undetected fires originating within the high speed gearbox (HSGB) from breaching the HSGB case, which could result in engine damage and increased difficulty in extinguishing a fire, and to prevent undetected low pressure (LP) compressor shaft location bearing failure, which could result in LP compressor and turbine shaft assembly failure, turbine overspeed, and possible uncontained engine failure, do the following:

Requirements for All Applicable Airplanes and Engines

(a) Incorporate the following service bulletins concurrently or before accomplishing the requirements of RR Mandatory Service Bulletin (MSB) RB.211-72-C963, dated December 4, 2001, or RR MSB RB.211-72-C863, dated February 15, 2002, whichever is applicable, as specified in paragraphs (b) through (d) of this AD:

(1) Install a new design engine front bearing housing assembly in accordance with RR SB RB.211-72-6149, Revision 9, dated November 24, 1999.

(2) Install a revised gearbox breather assembly in accordance with RR SB RB.211-72-C178, Revision 1, dated March 9, 2001.

(3) Install overheat detectors in the gearbox breather duct assembly, in accordance with RR SB RB.211-77-C144, Revision 1, dated February 13, 2002.

(4) Modify airplane instrument panels and consoles with the installation of the engine failure indicators, failure lenses, and marker, in accordance with Lockheed Martin SB 093-77-060, Revision 1, dated June 30, 2003.

RB211-524B-02 and RB211-524B-B-02 Engines

(b) Within three months after the effective date of this AD, for RB211-524B-02 and RB211-524B-B-02 engines, do the following:

(1) Install an LP compressor shaft extreme axial movement detector system in accordance with RR MSB RB.211-72-C963, dated December 4, 2001.

(2) Replace existing speed probe loom electrical support assembly, located on the engine front bearing housing assembly, with speed probe loom electrical support assembly P/N FW15212, in accordance with 3.A. Accomplishment Instructions of RR MSB RB.211-71-E047, dated August 2, 2002.

RB211-22B-02 Engines

(c) Within three years after the effective date of this AD, for RB211-22B-02 engines, install an LP compressor shaft extreme axial movement detector system in accordance with RR MSB RB.211-72-C863, dated February 15, 2002.

RB211-524B3-02, RB211-524B4-02, and RB211-524B4-D-02 Engines

(d) Within four years after the effective date of this AD, for RB211-524B3-02, RB211-524B4-02, and RB211-524B4-D-02 engines, install an LP compressor shaft extreme axial movement detector system in accordance with RR MSB RB.211-72-C963, dated December 4, 2001.

Alternative Methods of Compliance

(e) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine Certification Office (ECO) for engines or Manager, Atlanta Aircraft Certification Office (ACO) for airplanes. Operators must submit their request through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, ECO, or Manager, ACO.

Note 1: Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the ECO or ACO.

Special Flight Permits

(f) Special flight permits may be issued in accordance with §§ 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be done.

Note 2: The subject of this AD is addressed in CAA airworthiness directive AD 006-12-2001, AD 003-08-2002, and AD 006-02-2002.

Documents That Have Been Incorporated by Reference

(g) The actions in this AD must be done in accordance with the following Rolls-Royce plc service bulletins and Lockheen Martin service bulletin:

Document No.	Pages	Revision	Date
RB.211–72–6149 Total pages: 72	All	9	Nov. 24, 1999.
RB.211–77–C144 Total pages: 57	All	1	Feb. 13, 2002.
RB.211–72–C963 Total pages: 75	All	Original	Dec. 4, 2001.
RB.211–71–E047 Total pages: 6	All	Original	Aug. 2, 2002.

RB.211–72–C863 Total pages: 75	All	Original	Feb. 15, 2002.
Lockheed Martin 093–77–060	1	1	Jun. 30, 2003.
	2–4	Original	Apr. 11, 2002.
	5	1	Jun. 30, 2003.
Total pages: 10	6–10	Original	Apr. 11, 2002.

This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from Rolls-Royce plc, PO Box 31, Derby, England, DE248BJ; telephone: 011-44-1332-242-424; fax: 011-44-1332-245-418 and Lockheed Martin & Logistics Center, 120 Orion Street, Greenville, South Carolina 29605. Copies may be inspected at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

Effective Date

(h) This amendment becomes effective on August 25, 2003.

Issued in Burlington, Massachusetts, on July 10, 2003.
Francis A. Favara,
Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.
[FR Doc. 03-17949 Filed 7-18-03; 8:45 am]
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